Integrity - Service - Excellence

DMO Architecture Contract Effort

Russell Hutt
DMO Arch Officer
AFAMS/MSN

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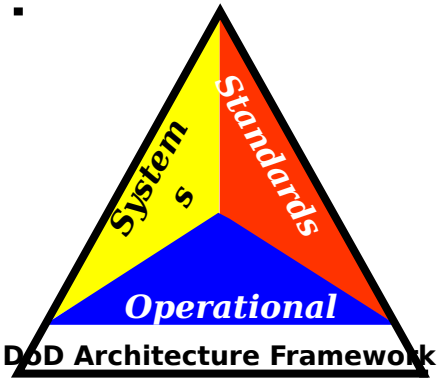
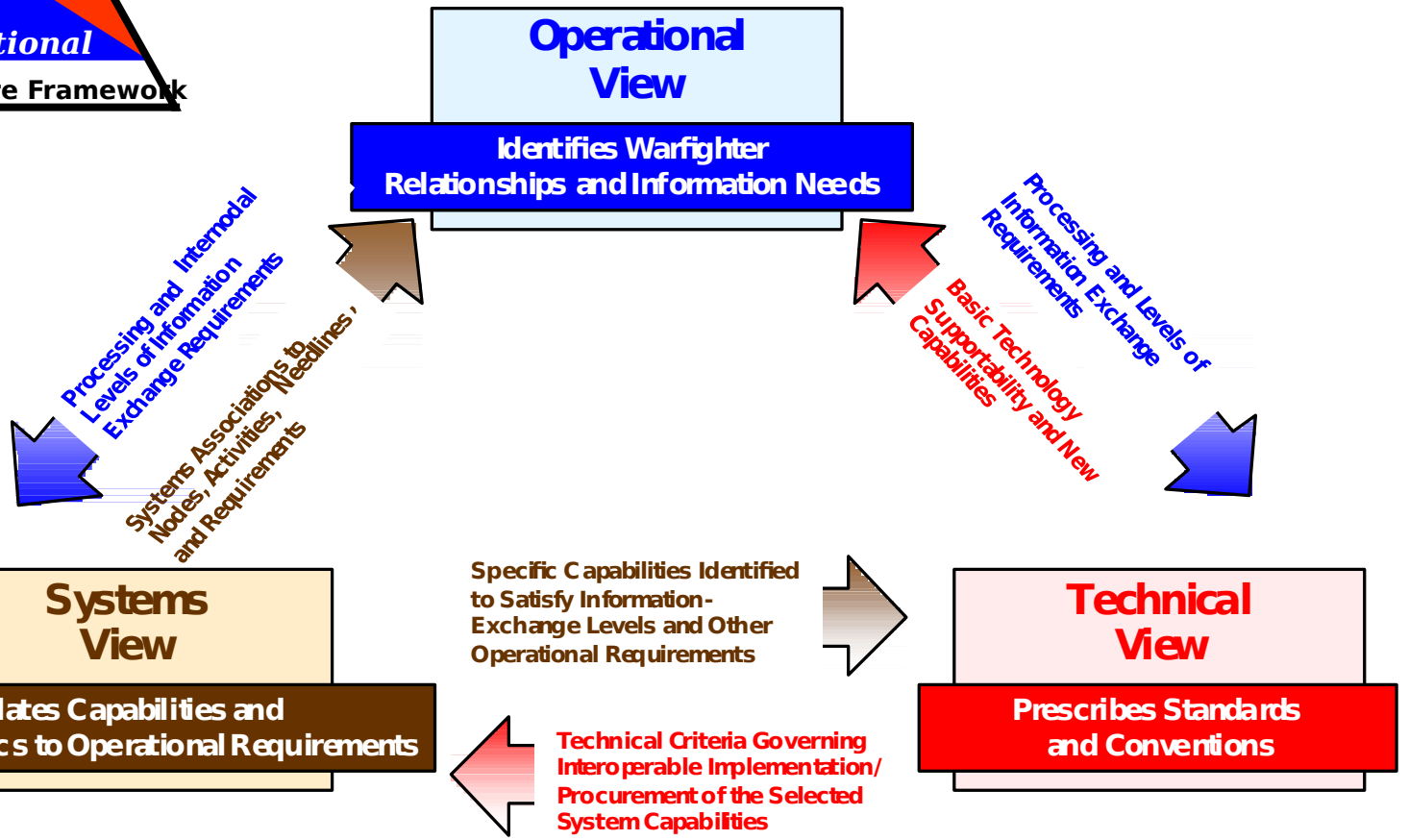
Why Focus on Architectures

- **Information Technology Management Reform Act of 1996 (Clinger-Cohen Act)**
  - **Congress concerned with lack of interoperability and chaotic proliferation of IT systems in government**
  - **Act requires all government organizations to develop & use IT architectures as basis for planning and funding all IT systems**
- **Office of Management & Budget Circular A-130**
  - **Requires IT system investment to be consistent with architectures**
- **USAF Policy on Enterprise Architecting (SECAF letter Aug 02)**
  - **Enterprise architecting will be used to guide all info systems investments**
  - ***MAJCOM and HQ functionals responsible for generating operational architectures***
  - Acquisition agents responsible for system and technical architectures
  - **AFI 33-124 Enterprise Information Technology Architectures**

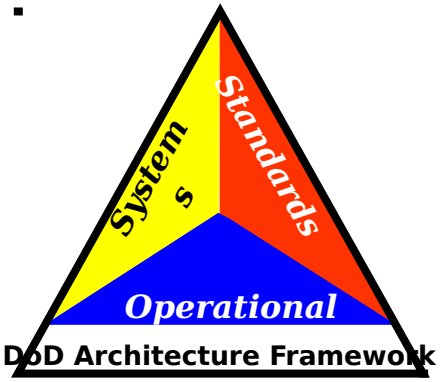
C4ISR/DoD Architecture Framework




Operational View
Identifies Warfighter Relationships and Information Needs
Processing and Intermodal Levels of Information Exchange Requirements
Systems Associations to Needlines, Activities, Nodes, and Requirements
Processing and Levels of Information Exchange Requirements
Basic Technology Supportability and New Capabilities
Systems View
Relates Capabilities and Characteristics to Operational Requirements
Specific Capabilities Identified to Satisfy Information-Exchange Levels and Other Operational Requirements
Technical View
Prescribes Standards and Conventions
Technical Criteria Governing Interoperable Implementation/ Procurement of the Selected System Capabilities

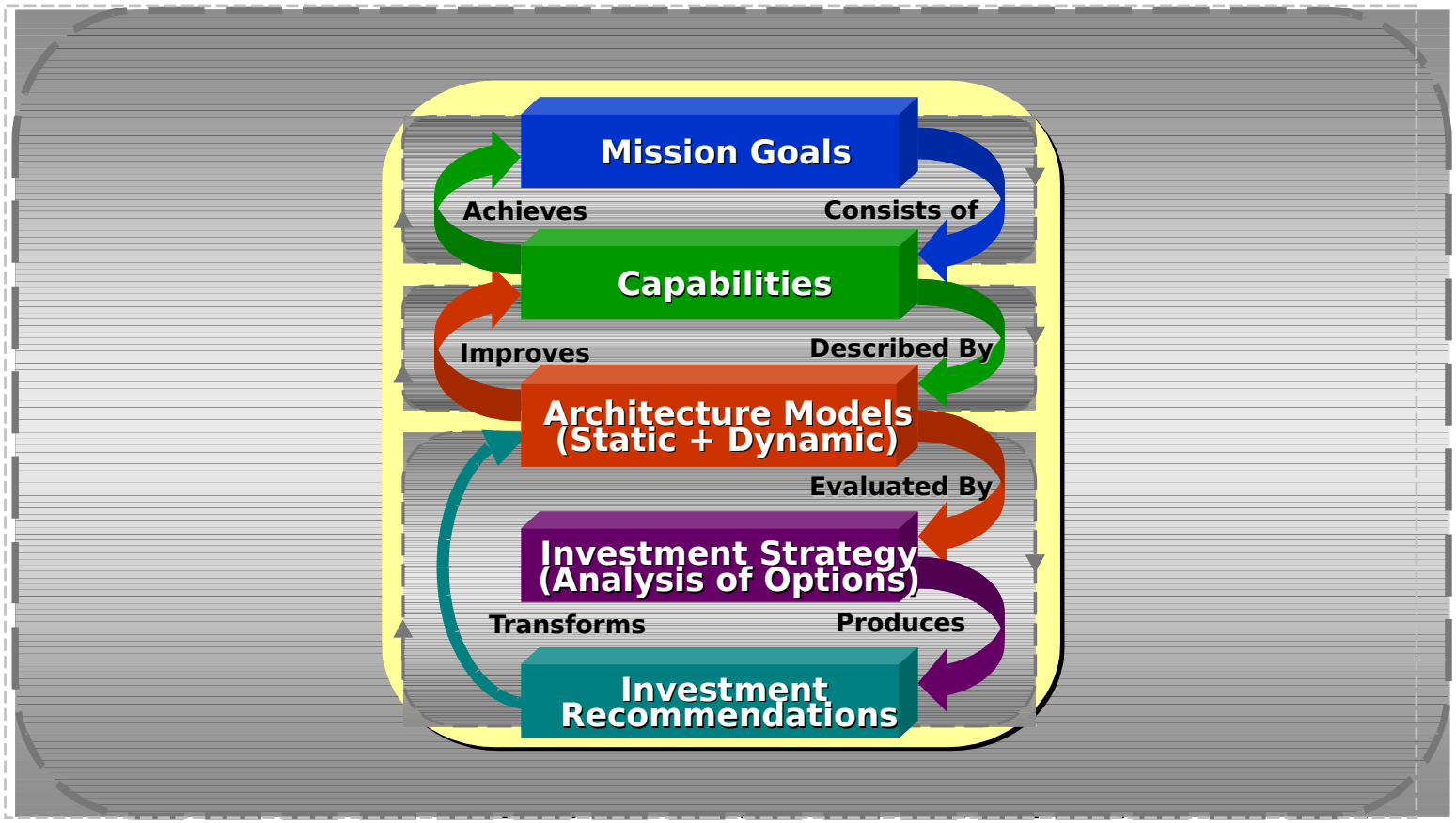
All Views

Provides the scope, purpose, intended use(s) and definition of all terms used in the architecture (i.e. the high-level information & foundational underpinnings of an architecture)



DoD Architecture Framework

Standards Promote Architectures



Standards are Critical Components of an Architecture

Proposed Methodolog

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Concepts

National Military Strategy

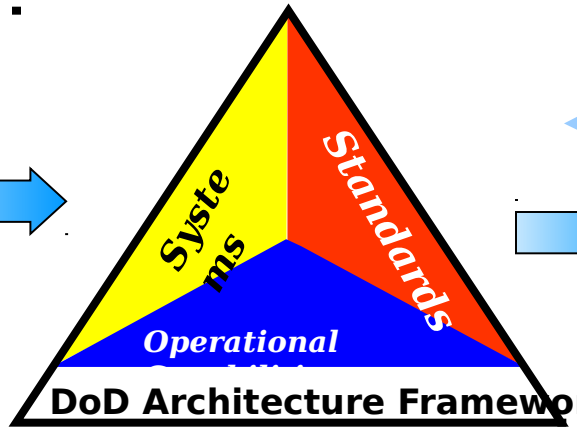
Joint Vision

Joint Concept of Operations

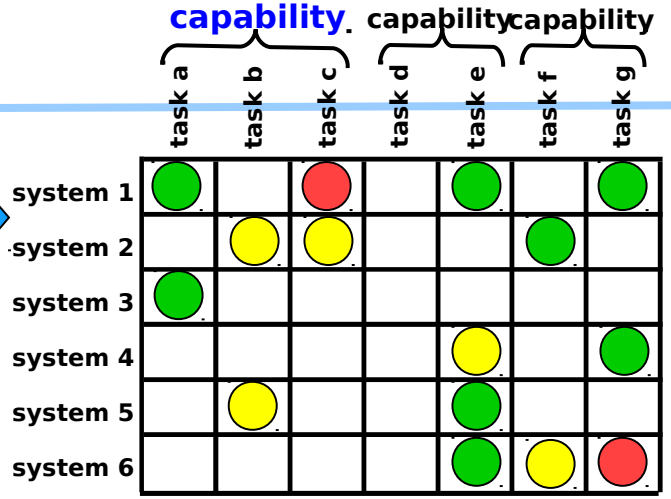
Joint Operating Concepts

Service Operating Concepts

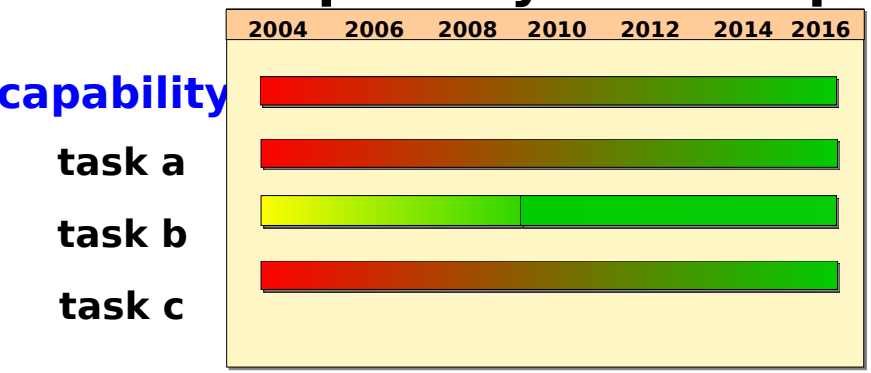
Architectures



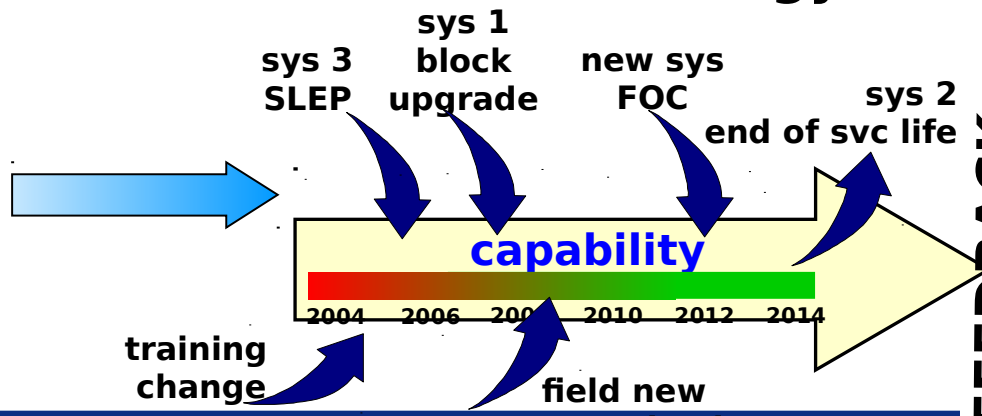
Assessment



Capability Roadmap



Resource Strategy



FEEDBACK

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AF XI Mission

- **AF XI Mission: Close the seams in the "Kill Chain" between Find, Fix, Track, Target, Engage, and Assess by integration of manned, unmanned, and space systems**

- **AF XIWM Mission: Provide policy, guidance, oversight, advocacy and coordination for the Modeling and Simulation Community**

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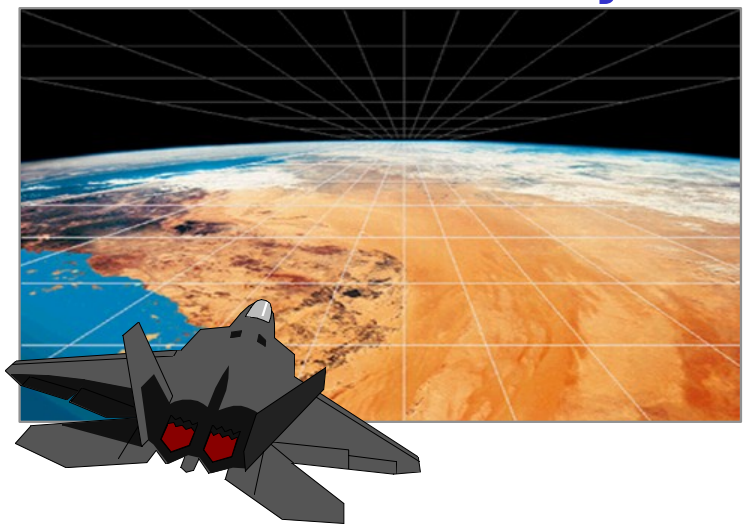
AFAMS Role

- **Implement AF/Joint/DoD M&S Policy and Standards**
- **Coordinate and Manage Major M&S Programs and Initiatives**
- **Oversee development of robust M&S synthetic environments**
- **Project lead for DMO**

- **Coordinate the Integration of the M&S C4ISR architectures for the M&S Community**



Architecture Council Structure

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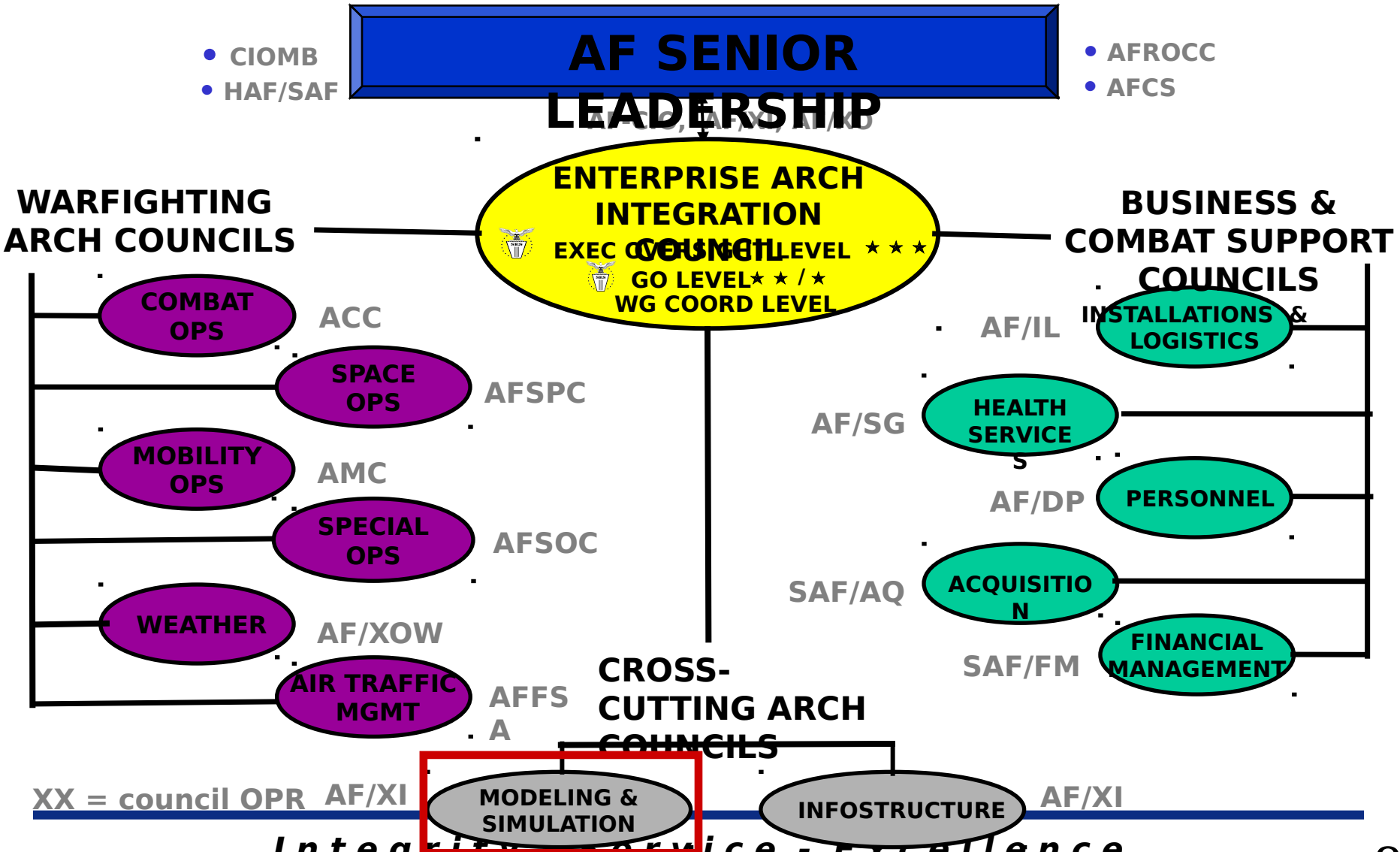

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DMO Architecture Tiger Team

- **M&S Architecture Council tasked AFAMS to stand up a pilot effort on DMO architecting**
  - AFAMS worked initial effort in-house with DMO Project Lead
  - 4/5 Feb 03, AFAMS DMO Architecture Tiger Team met

- **Meeting Objective**
  - Review DMO's High-Level Operational Concept, Operational Architecture View - #1 IAW C4ISR Architecture Framework
  - Establish Roles & Responsibilities and Proposed Schedules for the development of DMO architectures

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Why Fund DMO Architectures

- **Implementation of the DMO will be curtailed if the architecture effort is delayed. Misconceptions about DMO and its relationship to DMT and JSB will persist.**
- **This is a Gen Jumper's number one priority and it's stumbling along right now because users have a difficult time articulating just what DMO is.**
- **Establishing and following the architecture process will clarify the mission benefits gained from DMO.**

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DMO Architecture Status

- **Multiple approaches identified on how to proceed with completing development of required architecture products.**
- **Task order accomplished against existing contract for the first iteration of an OV-5**
- **Current $100K effort**
  - **High-Level Functional Description, Activity Model (OV-5)**
- **Require follow-on funding for completion of remaining required architecture products**

AF Enterprise to M&S Enterprise

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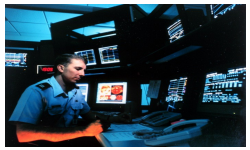

Operations

Analysis

Training

Experimentation

Acquisition

Warfighter

Space & C4ISR TF

Global Strike TF

Global Mobility TF

Nuclear Response TF

Global Response TF

Homeland Security TF

Other TFs

Business

Finance

Acquisition

Personnel

Log. & Installations

Programs/Systems

DMO DMT NASM AWSIM OTHERS JDEP JSB

The Air Force Modeling and Simulation Enterprise Architecture is represented in operational missions and organizational activities.

The AF M&S Enterprise Architecture (OV-1)

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LVC Life Cycle

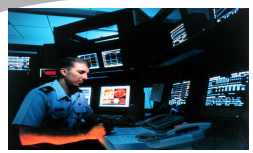
PLANNING
- Complete M&S Domain Plan
- Configure Even

PREPARATION
- Install M&S Sys
- Initialize LVC/domain
- Validate M&S Sys
- Rehearse LVC/domain
- Accredit LVC/domain

OPERATION
- Provide Battlefield Realism
- Control Exercise
- Provide Tech Support

FEEDBACK
- Collect Data
- Conduct Evaluation
- Provide Continuous Feedback
- Conduct AAR
- Archive AAR

RECOVERY
- Recover M&S Sys
- Maintain M&S Sys
- Store M&S Data



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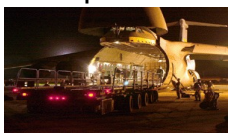

Log. & Installations

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DMO Architecture Products (con't)

- **Key Products**
  - **Scope and purpose of simulation, overview (AV-1)**
  - **Common, integrated dictionary (AV-2)**
  - **High level operational concept graphic (OV-1)**
  - **Operational node connectivity description (OV-2)**
  - **Operations information exchange matrix (OV-3)**
  - **Command/ Organization Relationship (OV-4)**
  - **Logical data model (OV-5)**
  - **System interface description (SV-1)**
  - **Technical architecture profile (TV-1)**

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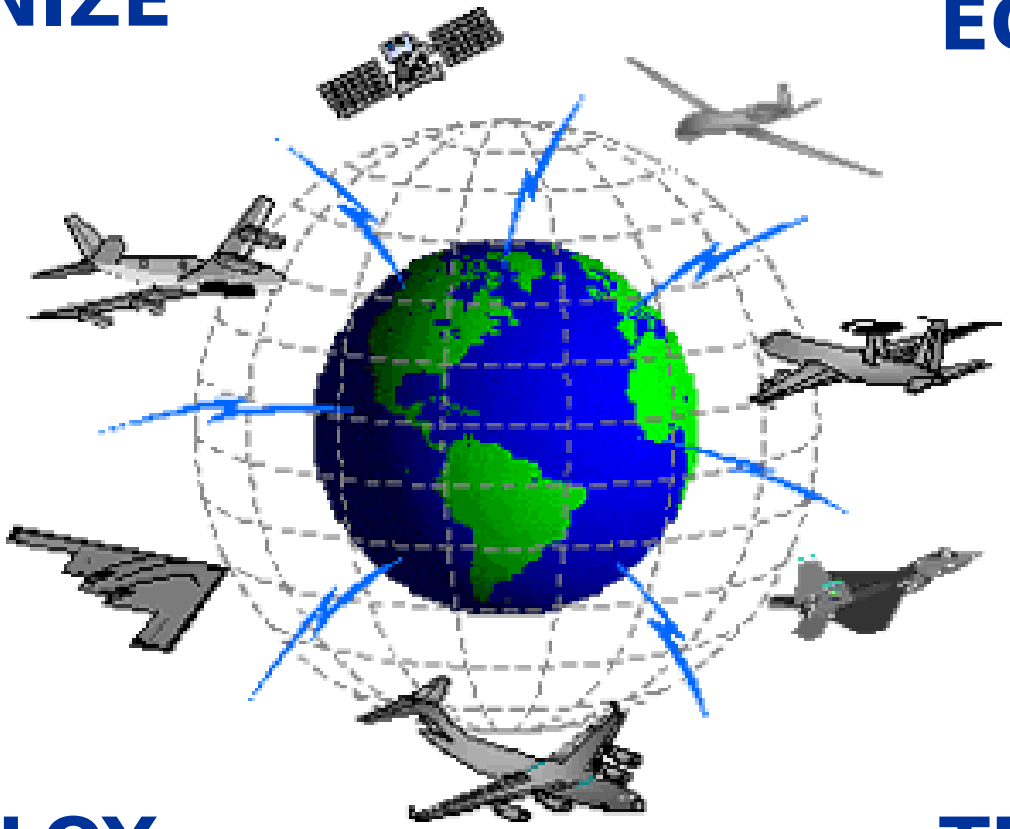
DMO OV-1

ORGANIZE

EQUIP



EMPLOY

TRAIN

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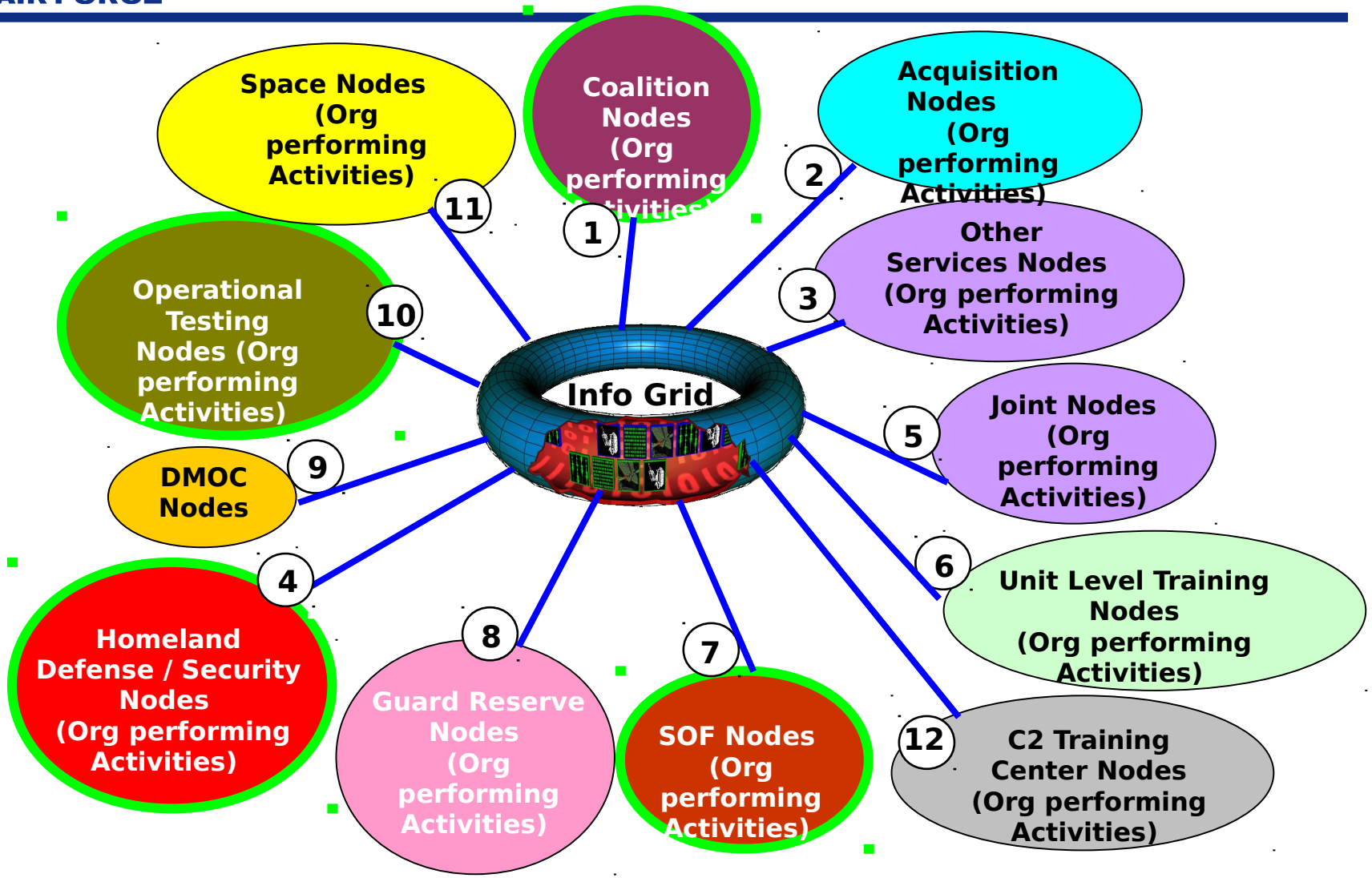
(DMO): OV-2

(Baseline version – 10 Apr 03)



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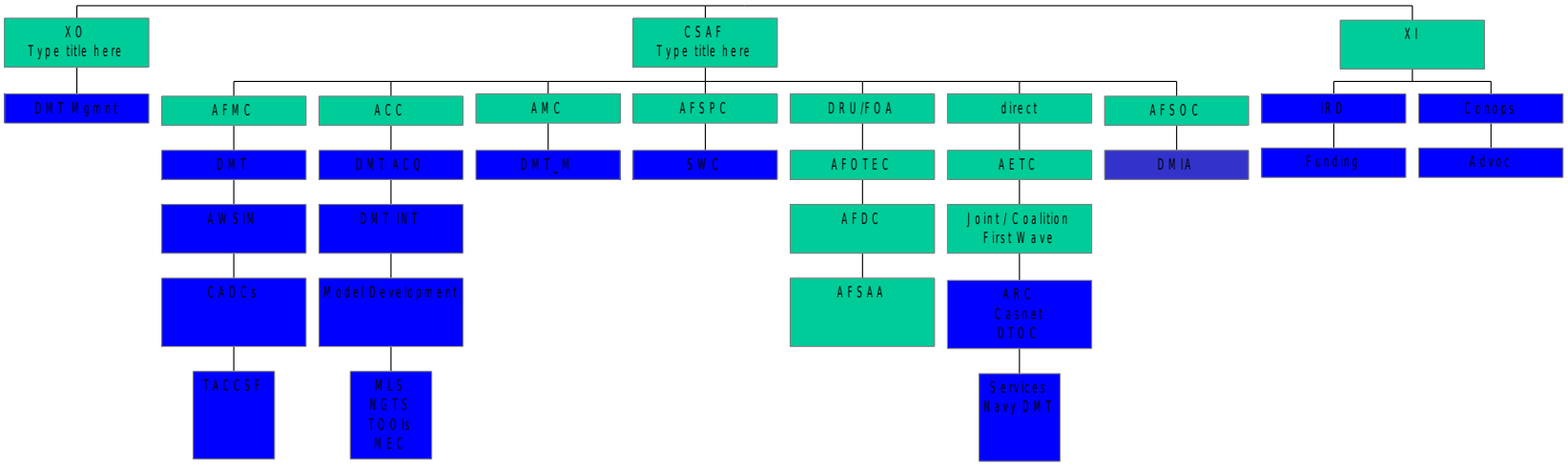
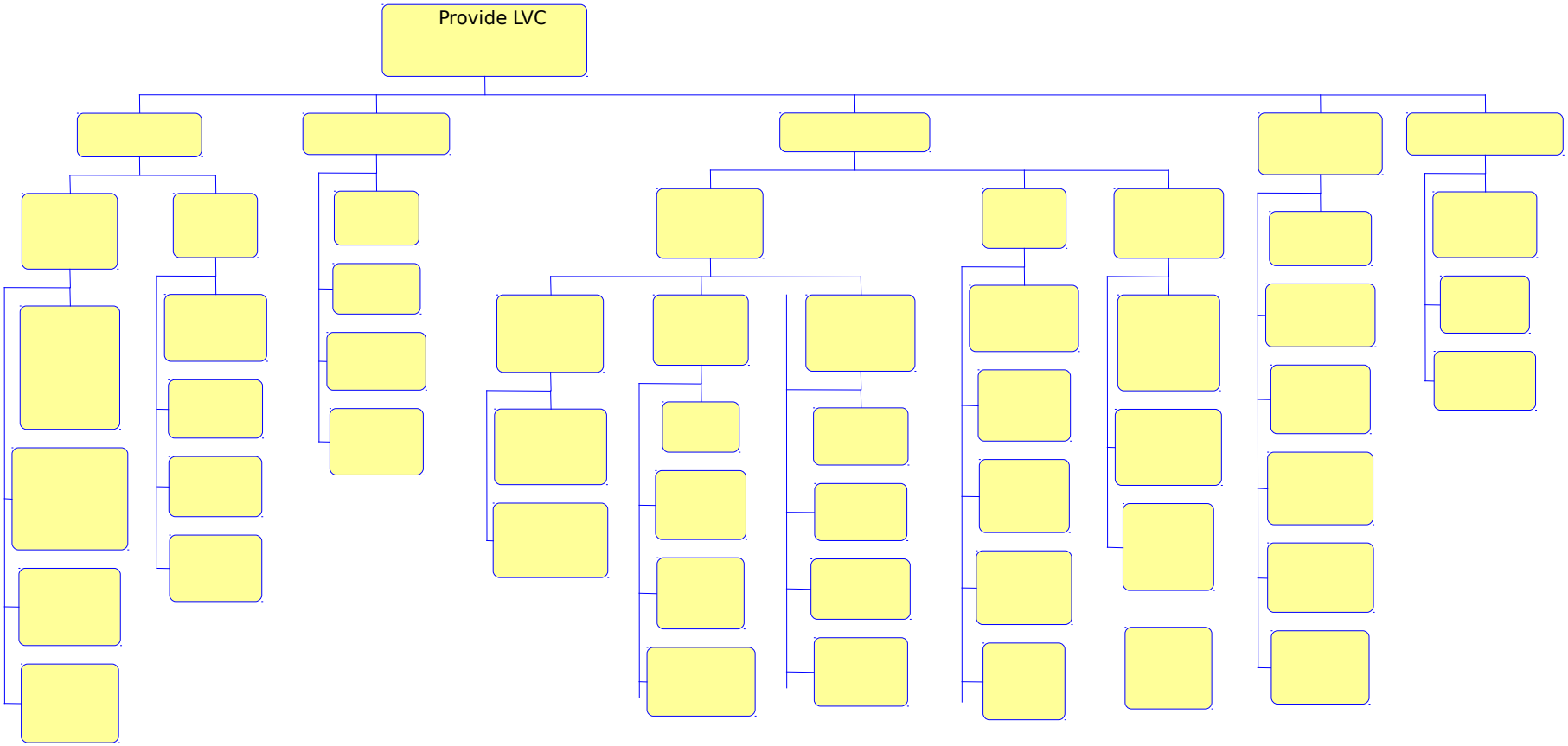
DMO OV-4



DMO ( ): Functional Decomposition (OV-5)



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DMO Functions ?

- DMO IRD (Capabilities)
  - Warfighter Integration
  - Decision Quality Information
  - Realistic Global Battlespaces
- DMO IRD (Initiatives)
  - DMT
  - SOF
  - JDEP
  - Range Enhancement
  - MLS
  - JSB
- CSAF Comment (Results)
  - JFAC Certification
  - AOC Certification
  - AOC Preparation
  - Mission Rehearsal
  - Training
- Functions by Nodes (DMO OV-2 focus elements)
- Wargames/Exercises
- Other? Combat ID, time-critical
- targeting or predictive battlespace awareness

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DMO Architecture Future Views

Resources:

- **Website**
  - http://www.afams.af.mil/programs/projects/dmo.htm
- **Reflector**
  - **AF-DMOATT@itcenter.org**
- **Methods for documenting architecture data/products**
  - **Register M&S architectures** http://afmsrr.afams.af.mil/register.cfm

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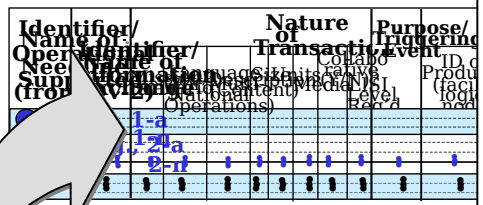
AF Architecting Info

- More information available at Websites
  - AF/CIO: www.cio.hq.af.mil/private/index.html
  - AFCA: www.afca.scott.af.mil/architectures/
  - DMO: http://www.afams.af.mil/programs/projects/dmo.htm

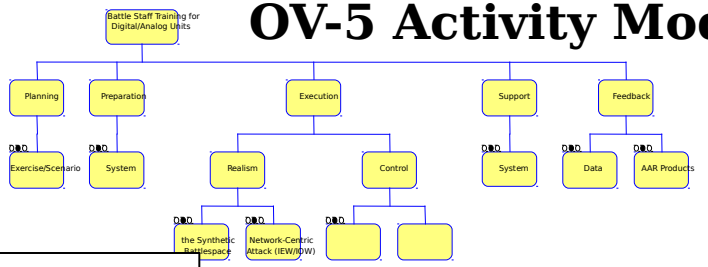
OV-3 Opn'l Info Exchange Matri

- One exchange line per
  - inter-node need line
  - action -response
- Provides requirement for system interface descriptio



1

OV-5 Activity Model



High Level Opn'l Description

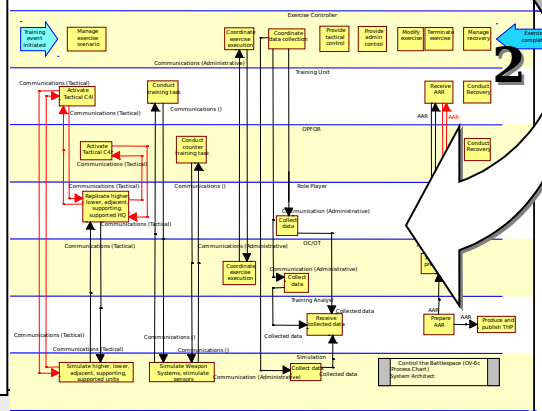
Ex Participants
- Ex Control
- Role Player
- Simulations
- Training Unit
- Training Analyst

Major Functions:
- Exercise Planning
- System Prep
- Exercise Execution
- Feedback
- System Support

C4I Interface

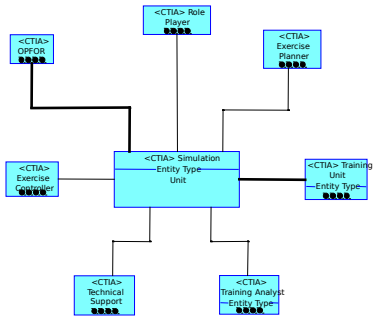
Data Types:
- System Config ~ Initialization
- Position Location
- Communications (Messages)
- Tactical Event
- Observation
- Environment ~ Weather
- Alert

- From IRD / CONOPS
  - Actors
  - Major exercise "functions"
  - Tasks - Nominal Steps



2

4



- One per Major Function
- Consolidate node need lines across tasks

3

Lane for Exercise Participant
- (Almost) one per Function-Task requiring interoperability
- Nominal steps - events for each task
- Vertical interface/interoperability reqs.

OV-2 Node Connectivity

OV-6c Opn'l Event Trace

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Conclusions

- **Good progress to date with limited internal resources and contractual seed money available**
- **Additional work is critical to moving DMO ahead and is a crucial link to accomplishing overall AF architecting initiative**
- **DMO architecture products are necessary to support continued collaboration with JSB architecture products to ensure interoperability and improve overall systems capabilities**
- **Will continue to update MSAC on a regular basis to keep the greater AF community informed on progress as it is made**

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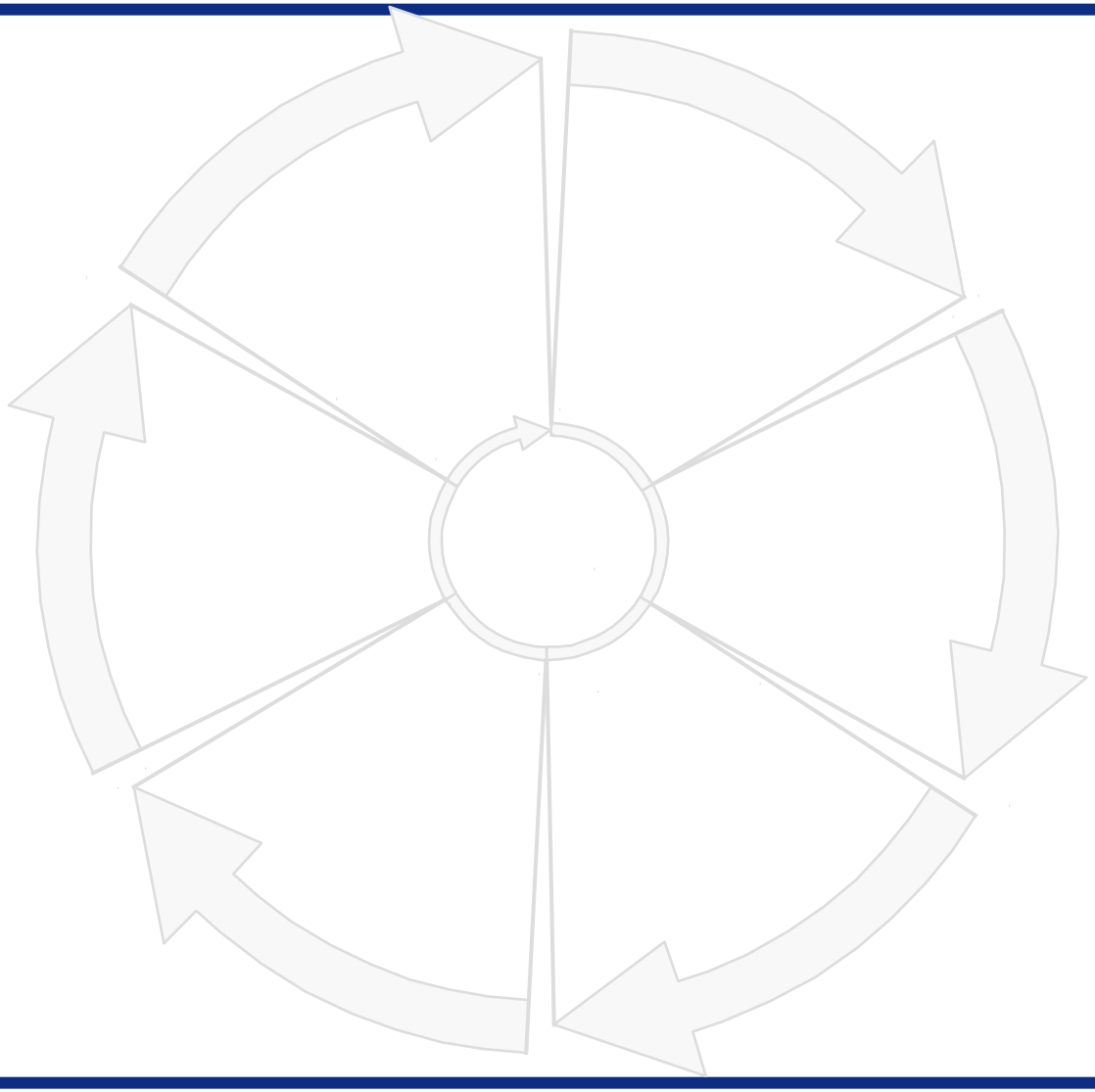
Backup Slides



DMO AV-1

Overview and Summary Information (AV-1)

Purpose: For Program Development & Influence FY05 APOM

Scope: Develop OV-1/2/3/4/5, SV-1, TV-1/2 – "As-Is" & "To-Be"

Context: DMO vision

Assumption & constraint: - no additional resources for architecting

Findings: No findings to date, No Recommendations to date

Tools and File Formats:

- Tool Suite: Popkins System Architect; MS Suite
- "MSE Arch (Arch View) ver #.### .(File Format)"
- MSRR references arch products & hosts DMO AV-2, & TV-1/2
- Will use AFMSRR to nominate, review & approve terms, definitions & standards

DMO AV-2

Integrated Dictionary (AV-2)

1. **IDENTIFICATION:** Name of Architect, Date

2. **INTRODUCTION**
   - Central source for definitions found in all architecture products (views)
   - Makes arch views stand-alone – no additional references needed
   - DMO AV-2 will rely on MSE Architecture AV-2 - repository on AFMSRR

3. **PURPOSE**
   - All terms to include labeled graphical items will have an entry
   - New terms will be submitted into AFMSRR for approval and inclusion
   - Terms will be assigned an owner for maintenance (updates, etc).

4. **GLOSSARY of TERMS**
   http://afmsrr.afams.af.mil/glossary.cfm
   http://afmsrr.afams.af.mil/
   (find the Glossary icon to use the additional functions provided by the web browser's side toolbar)

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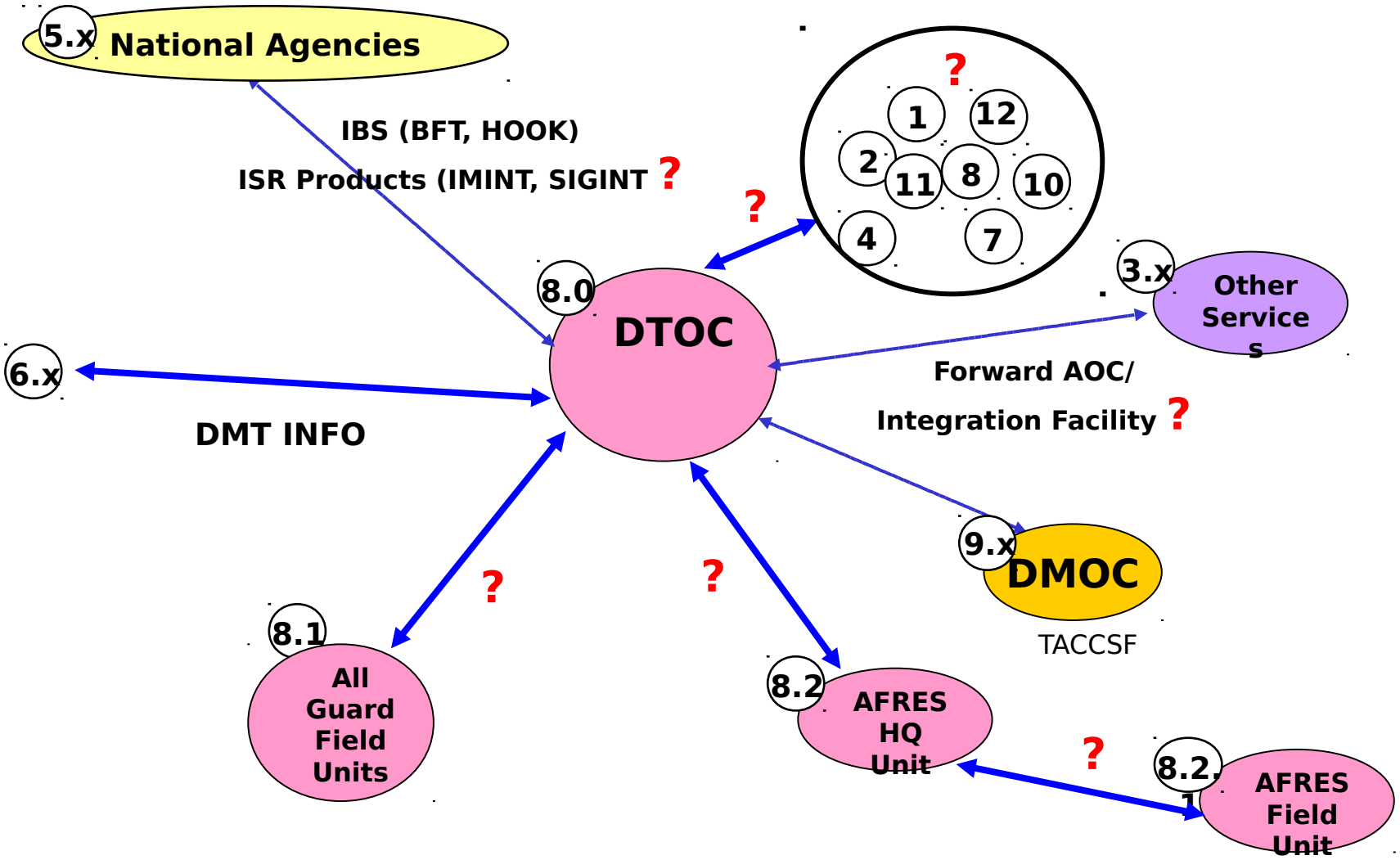
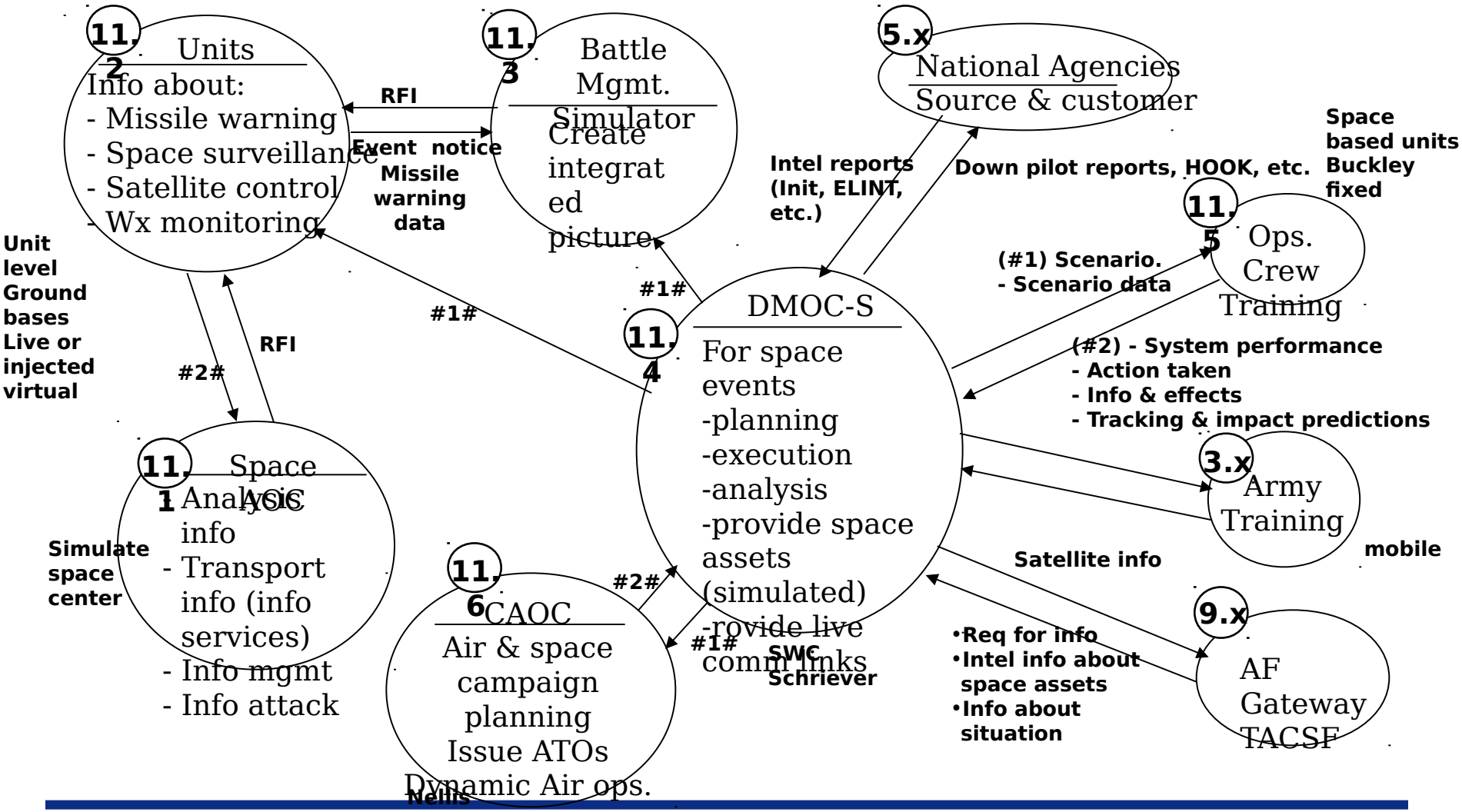
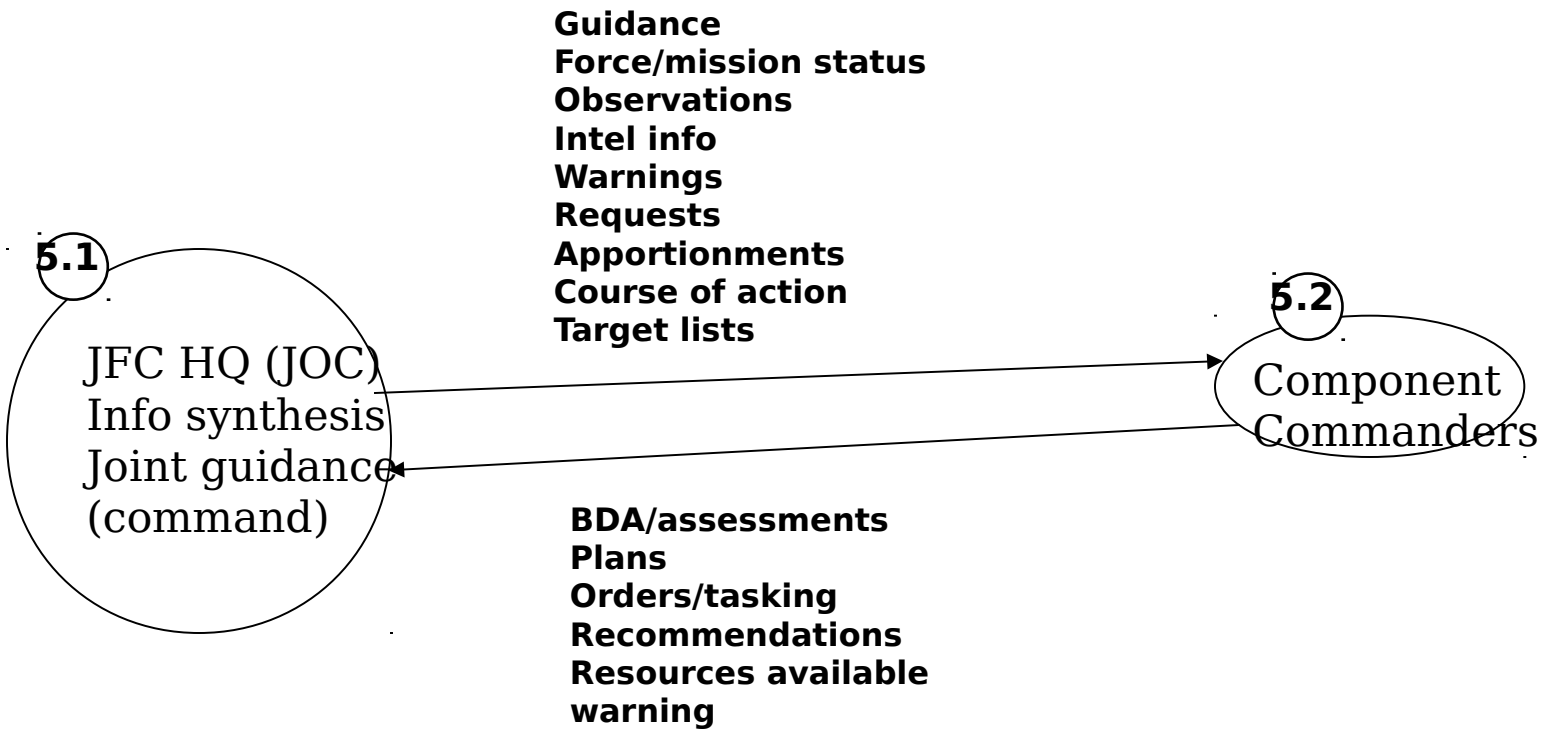
(DMO): OV-2 #8 - Guard Nodes



#11 Space Nodes



#5 Joint Nodes



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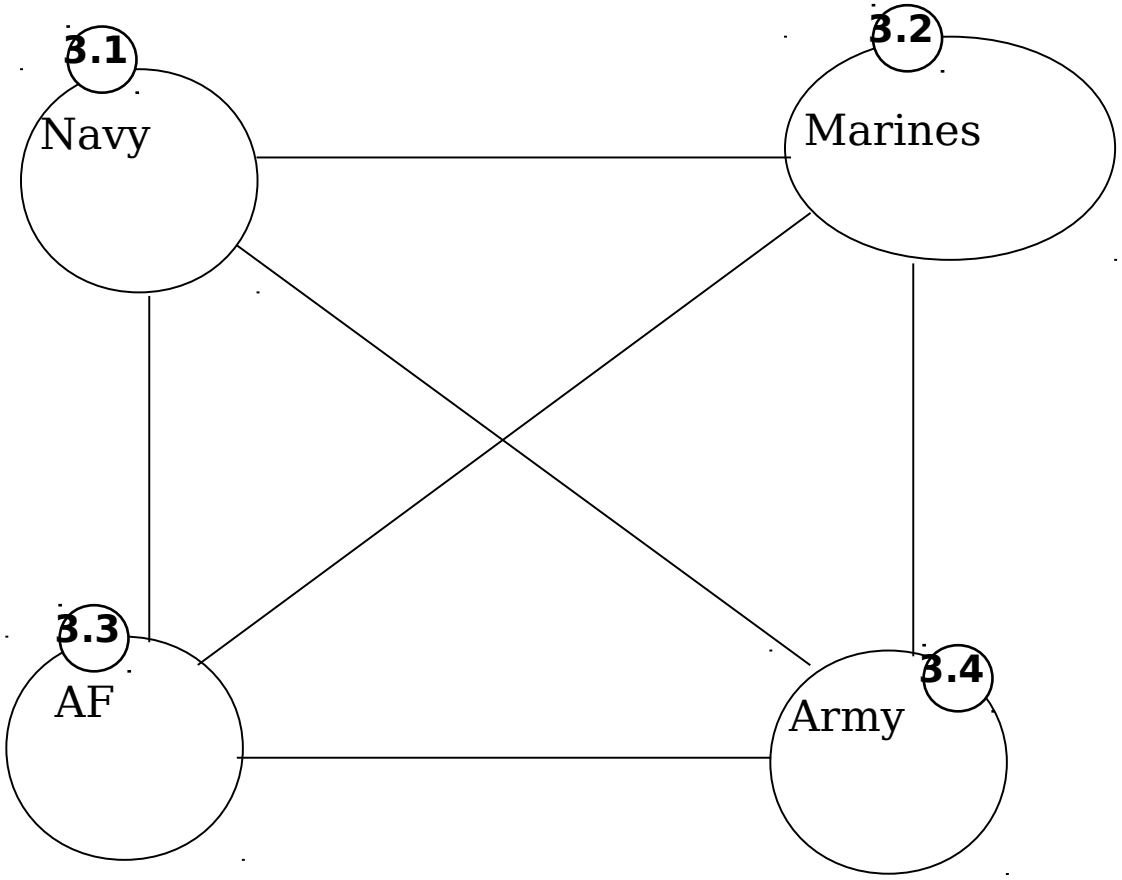
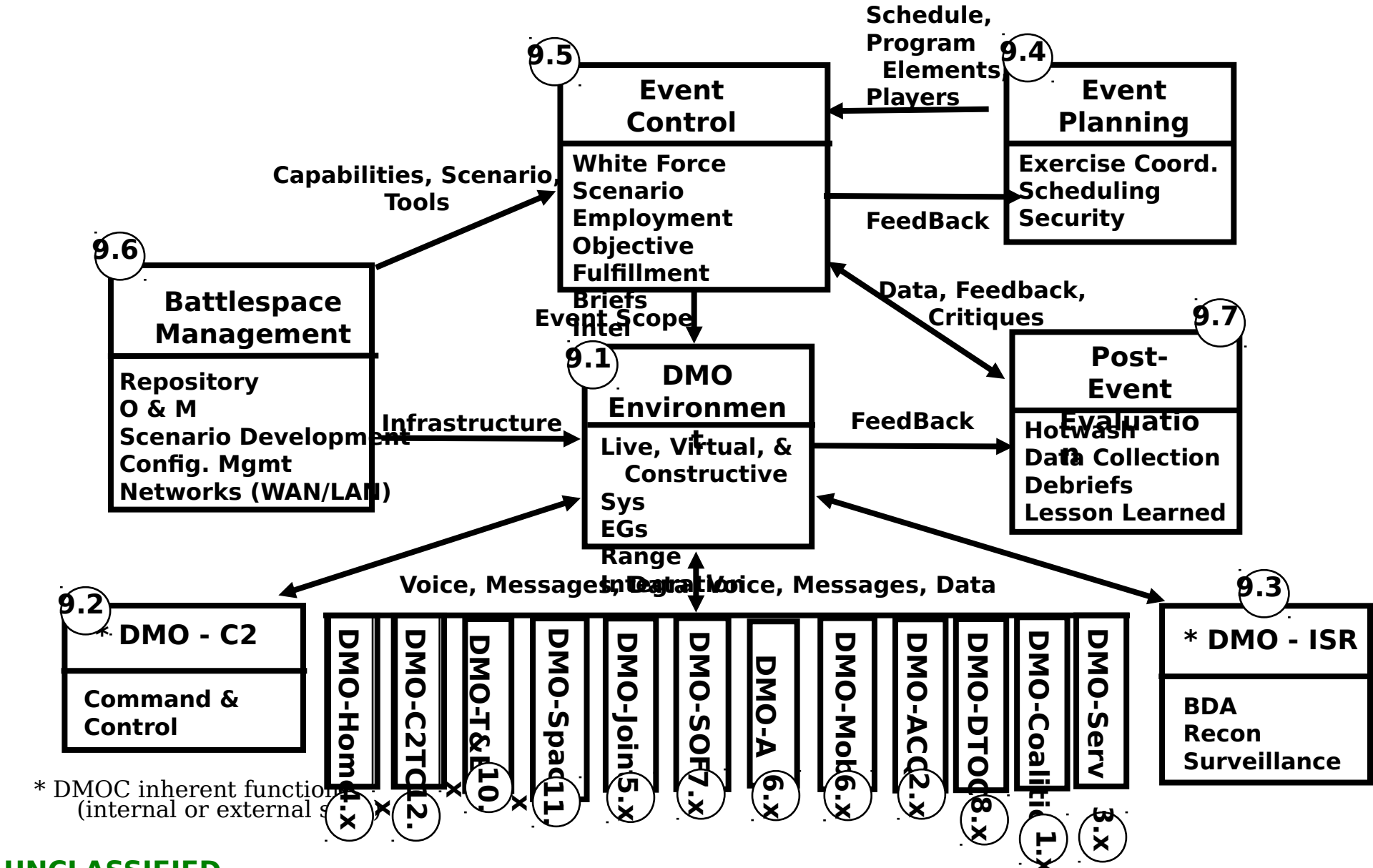
#3 Inter-Service Nodes

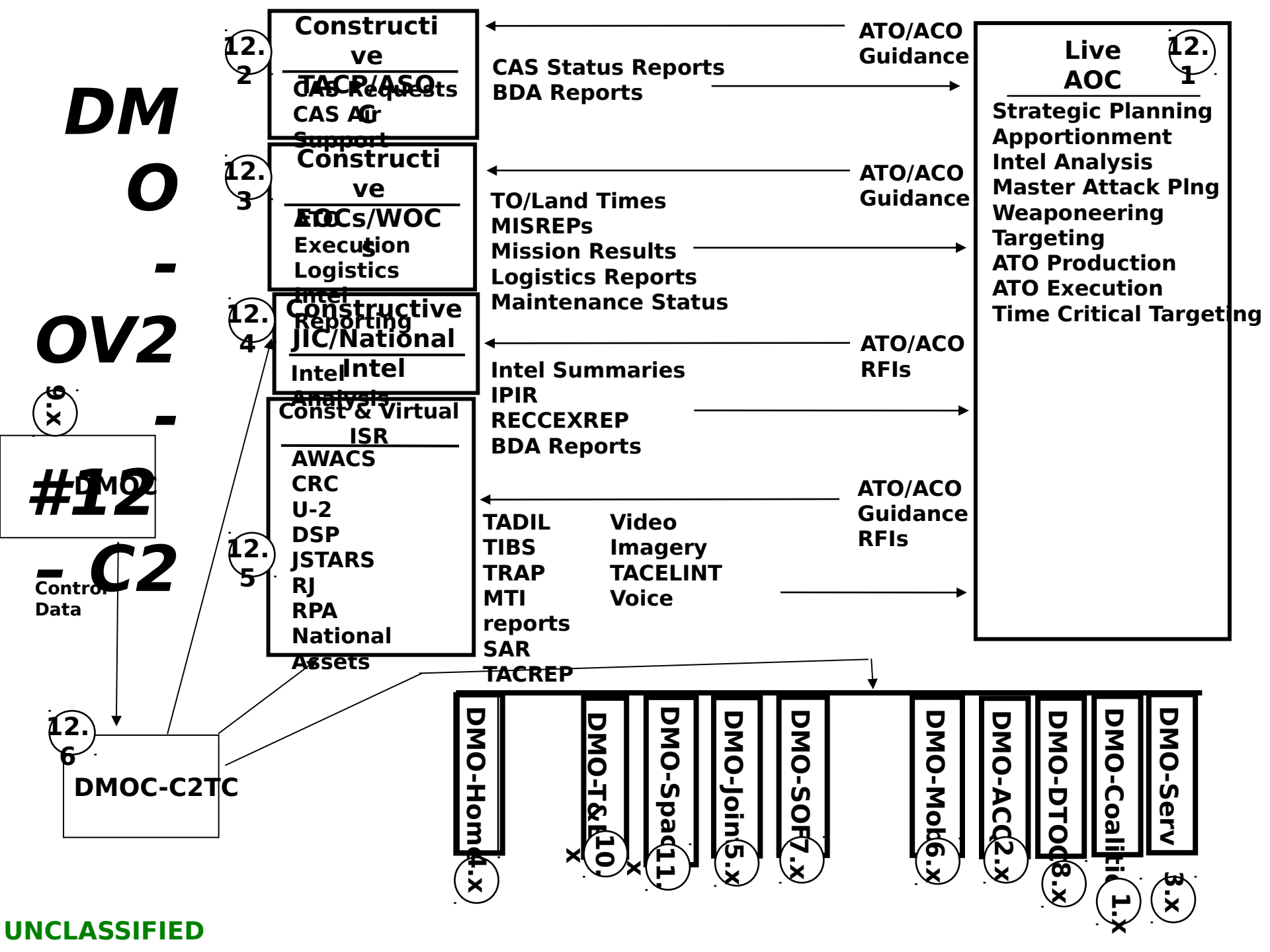


DMO - OV2 - #9 DMOC



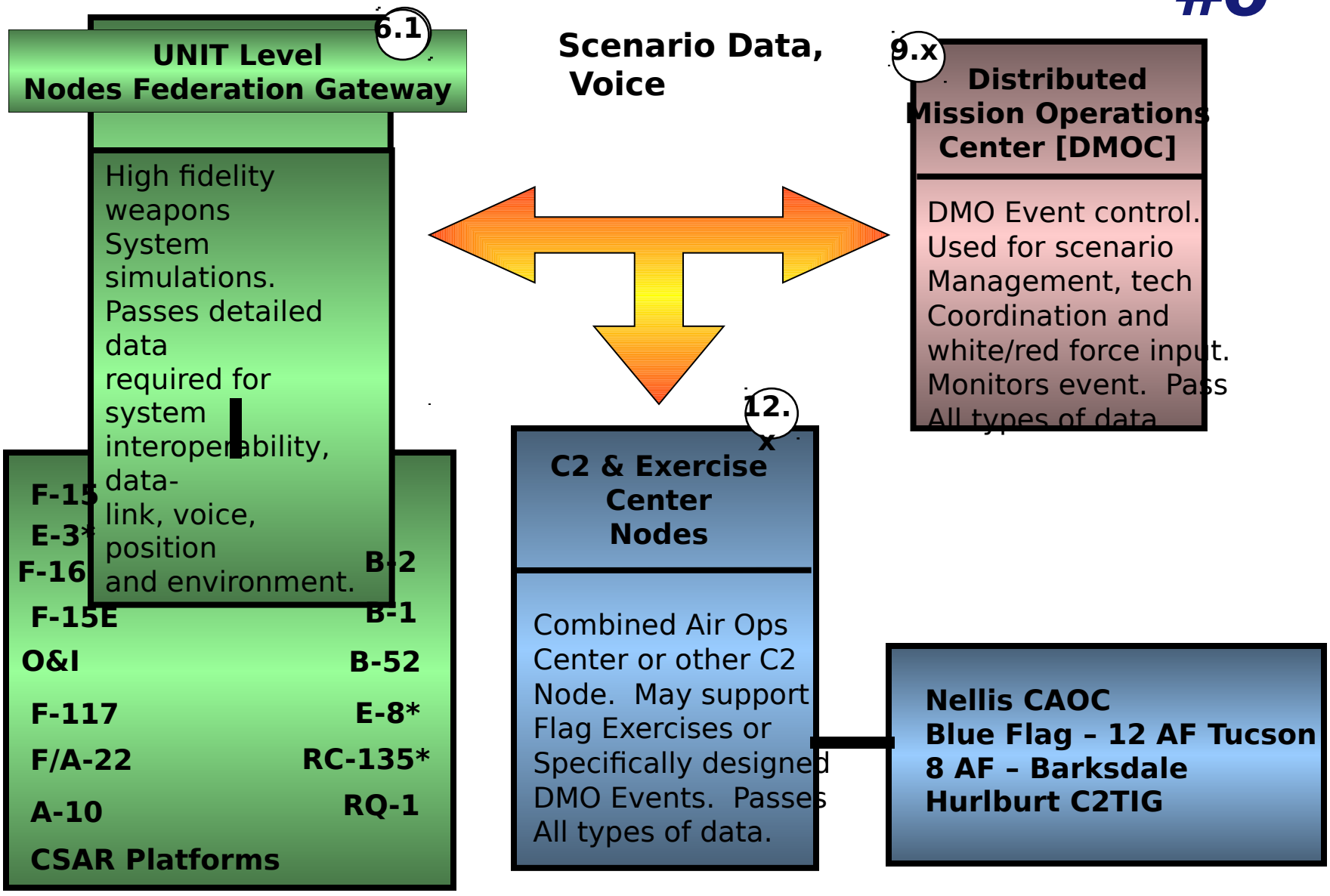
* DMOC inherent functions (internal or external s

DMO-OV2-#12-C2



UNCLASSIFIED

Unit Level Training Nodes OV-2 - #6



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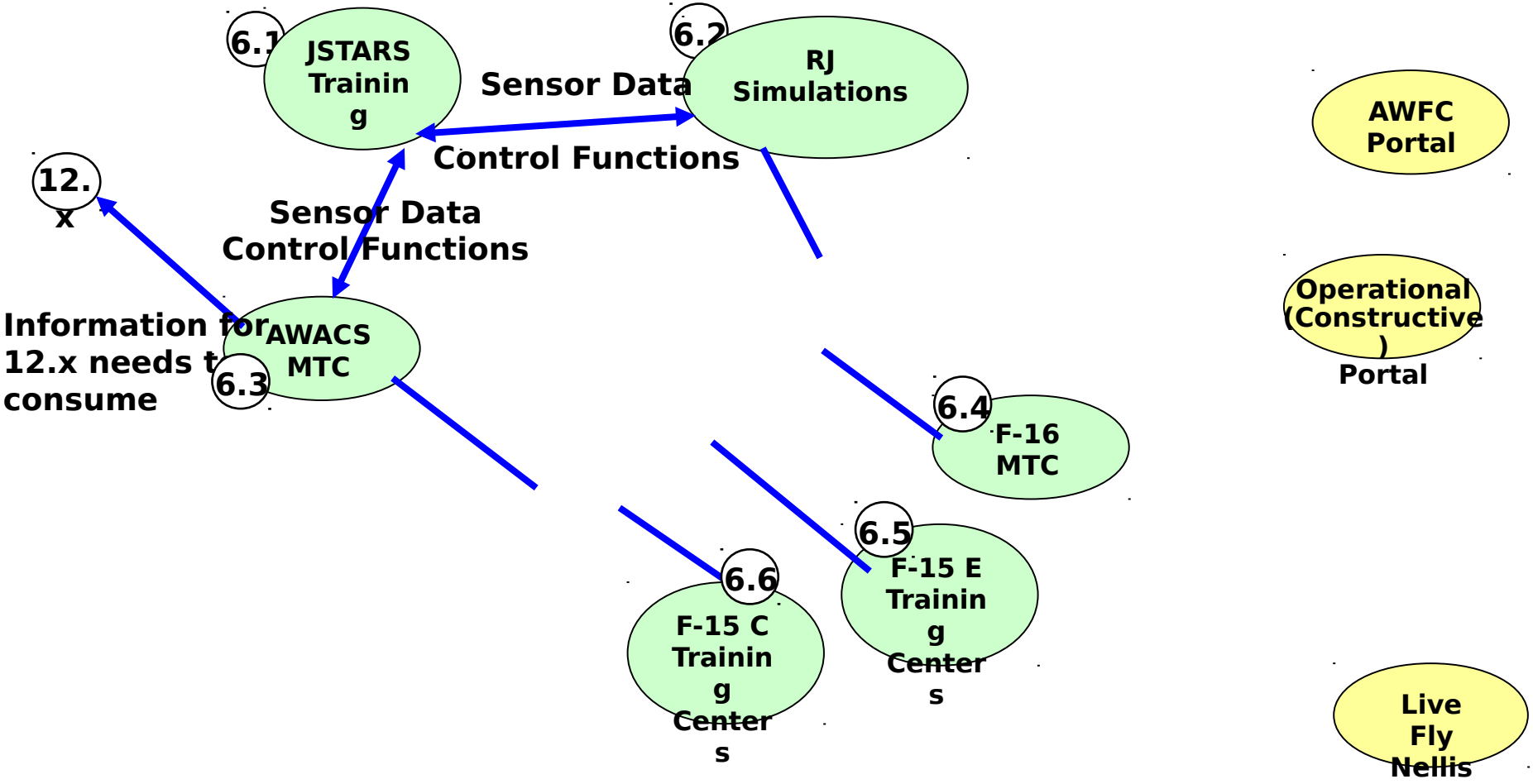
(DMO): OV-2 Unit Level Nodes (i.e. decomp #6)



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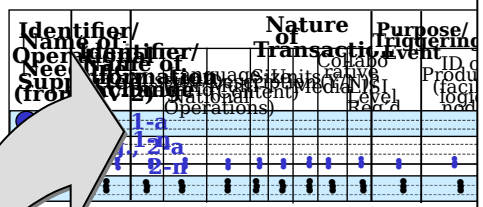

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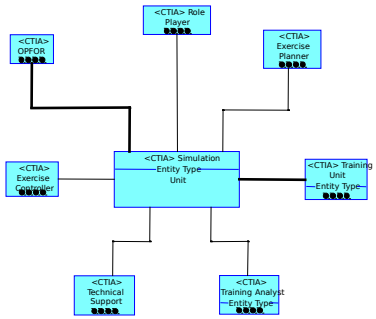

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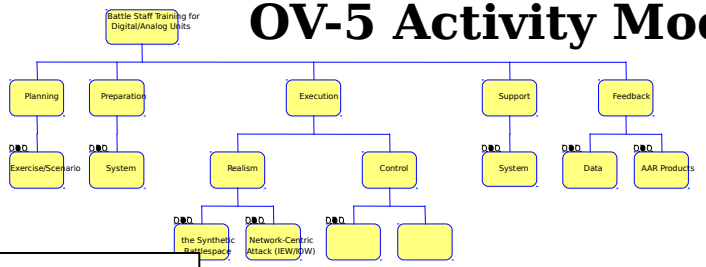
OV-2 Node Connectivity

1



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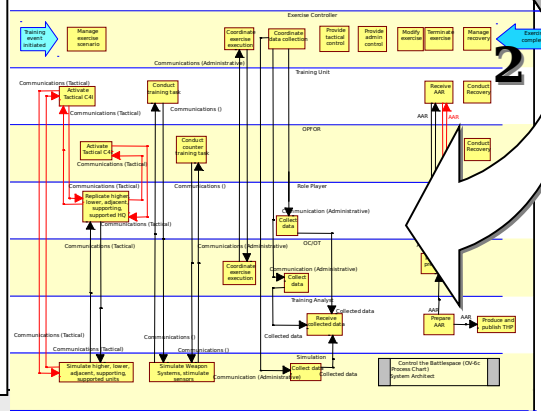
  - Major exercise "functions"
  - Tasks - Nominal Steps



2

3

Lane for Exercise Participant
- (Almost) one per Function-Task requiring interoperability
- Nominal steps - events for each task
- Vertical interface/interoperability reqs.

OV-6c Opn'l Event Trace